

CLAIMS

1. A production method for producing a light-emitting device in which a light-emitting layer at least including a n-type semiconductor layer and a p-type semiconductor layer is layered on a transparent crystal substrate, comprising the steps of:

forming a transfer layer on at least a part of the transparent crystal substrate or the light-emitting layer, which transfer layer is softened or set upon supplying an energy thereto;

pressing a mold formed with a minute unevenness structure against the transfer layer to transfer the minute unevenness structure to an outer surface of the transfer layer; and

forming a minute unevenness structure for preventing multiple reflection based on the minute unevenness structure transferred to the transfer layer.

2. A production method according to claim 1, wherein the step of forming the minute unevenness structure in the light-emitting layer includes a step of separating the transparent crystal substrate from the light-emitting layer after a substrate bearing layer is formed on a surface of the light-emitting layer where electrodes are to be formed.

3. A production method according to claim 1 or 2, wherein the step of forming the transfer layer includes a step of applying a silicon organic solvent to at least the part of the

transparent crystal substrate or the light-emitting layer to form the transfer layer, and the step of forming the minute unevenness structure for preventing the multiple reflection includes a step of dry etching the transfer layer with a chlorine gas using the transfer layer as a resist mask to form the minute unevenness structure for preventing the multiple reflection in the transparent crystal substrate or the light-emitting layer.

4. A production method according to claim 3, wherein the step of forming the minute unevenness structure for preventing the multiple reflection in the light-emitting layer includes a step of pressing a mold having an upper flat portion to be located near the bottoms of the minute unevenness structure for preventing the multiple reflection and a lower flat portion to be located at a position lowered from the upper flat portion by about the thickness of the upper semiconductor layer of the light-emitting layer against the transfer layer to transfer an upper flat portion and a lower flat portion together with the minute unevenness structure to the transfer layer, and forming electrode-forming portions by etching the upper and lower semiconductor layers of the light-emitting layer when dry etching is carried using the transfer layer as a resist mask.

5. A production method according to claim 3 or 4, wherein the etching step includes a step of adjusting a selection ratio of the etching speed of the light-emitting layer to that of

the resist from twofold to fourfold.

6. A production method according to any one of claims 1 to 5, wherein the step of applying the silicon organic solvent to form the transfer layer includes a step of applying the silicon organic solvent by potting or spray coating.

7. A production method according to any one of claims 3 to 6, wherein a pressing pressure of the mold is 5 MPa or higher and 150 MPa or lower.

8. A production method according to any one of claims 3 to 7, wherein a step of forming an unevenness structure larger than the minute unevenness structure on the minute unevenness structure of the light-emitting layer is carried out after the step of forming the minute unevenness structure for preventing the multiple reflection in the light-emitting layer.

9. A production method according to claim 8, wherein the unevenness structure has the shape of a prism or a microlens.